

Name _____

Numerical Patterns

Essential Question How can you identify a relationship between two numerical patterns?

COMMON CORE STANDARD CC.5.OA.3

Analyze patterns and relationships.

UNLOCK the Problem REAL WORLD

On the first week of school, Joel purchases 2 movies and 6 songs from his favorite media website. If he purchases the same number of movies and songs each week, how does the number of songs purchased compare to the number of movies purchased from one week to the next?

STEP 1 Use the two rules given in the problem to generate the first 4 terms in the sequence for the number of movies and the sequence for number of songs.

- The sequence for the number of movies each week is:

$+2$ $+2$ $+2$
 \curvearrowright \curvearrowright \curvearrowright
 2, , , , ...

- The sequence for the number of songs each week is:

$+6$ $+6$ $+6$
 \curvearrowright \curvearrowright \curvearrowright
 6, , , , ...

STEP 2 Write number pairs that relate the number of movies to the number of songs.

Week 1: 2, 6 Week 2: _____

Week 3: _____ Week 4: _____

STEP 3 For each number pair, compare the number of movies to the number of songs. Write a rule to describe this relationship.

Think: For each related number pair, the second number is _____ times as great as the first number.

Rule: _____

So, from one week to the next, the number of songs Joel purchased is _____ times as many as the number of movies purchased.

- How many movies does Joel purchase each week?

- How many songs does Joel purchase each week?



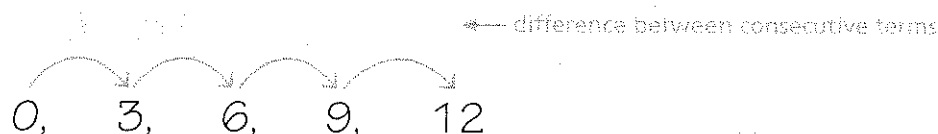
Example

When Alice completes each level in her favorite video game, she wins 3 extra lives and 6 gold coins. What rule can you write to relate the number of gold coins to the number of extra lives she has won at any level? How many extra lives will Alice have won after she completes 8 levels?

	Level	0	1	2	3	4	8
Add _____	Extra Lives	0	3	6	9	12	
Add _____	Gold Coins	0	6	12	18	24	48

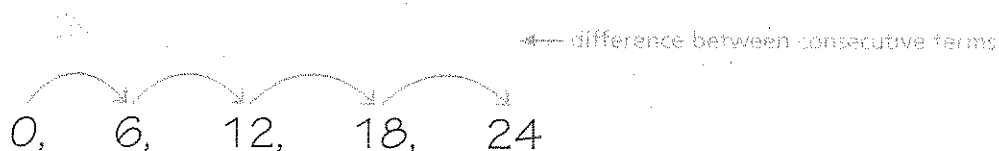
Multiply by _____ or
divide by _____

STEP 1 To the left of the table, complete the rule for how you could find the number of extra lives won from one level to the next.



From one level to the next, Alice wins _____ more extra lives.

STEP 2 To the left of the table, complete the rule for how you could find the number of gold coins won from one level to the next.



From one level to the next, Alice wins _____ more gold coins.

STEP 3 Write number pairs that relate the number of gold coins to the number of extra lives won at each level.

Level 1: 6, 3 Level 2: _____
Level 3: _____ Level 4: _____

STEP 4 Complete the rule to the right of the table that describes how the number pairs are related. Use your rule to find the number of extra lives at level 8.

Think: For each level, the number of extra lives is _____ as great as the number of gold coins.

Rule: _____

So, after 8 levels, Alice will have won _____ extra lives.

Math Talk

MATHEMATICAL PRACTICES

Explain how your rule would change if you were relating extra lives to gold coins instead of gold coins to extra lives.